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(54) **Enzymatic protein process and product.**

(57) **An enzymatic protein process removes objectionable odor and offensive taste from natural proteins to produce bland, odor-free products.**

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TABLE 3

Fatty Acid (No. of Carbons: double bonds)	Percent	
	EtOH	Lipase Treatment
4:0	0.26	
6:0	0.5	
8:0	0.61	1.13
10:0	1.58	2.41
12:0	2.39	3.45
14:0	9.68	10.99
14:1	1.24	0.28
15:0		2.23
16:0	28.64	31.32
16:1	2.50	2.95
17:0	0.19	
17:0	0.89	
17:1	0.42	0.40
18:0	11.62	13.74
18:1	27.75	24.49
18:1	2.07	1.48
18:2	2.94	2.59
18:2	0.47	1.11
18:3	1.21	1.33
20:0	0.08	0.12
?	0.92	
?	3.96	
	100.0	100.00

TABLE 4

		Enzyme Treated		Percent Reject
		EtOH Wash	EtOH Wash	
5				
10	(a) med ch	5.42	6.99	28.94
	(b) long ch	41.43	47.40	14.42
	(c) mono	33.98	29.59	-12.91
15	(d) di	2.94	2.59	-11.98
	(e) tri	1.21	1.33	10.09

- 20 (a) medium chain includes C4, C6, C8, C10, C12
 (b) long chain is C14:0, C16:0, C18:0, C19:0, C20:0, C22:0
 (c) mono is C14:1, C16:1, C18:1, C20:1
 25 (d) di is C16:2, C18:2, C20:2
 (e) tri is C18:3

Claims

- 30
1. Bland, odor-free denatured natural protein wherein the protein is milk or cheese whey, lactalbumen, beta lactoglobulin, serum albumen, immunoglobulins, or soybean protein which in the dry state remains substantially bland and substantially odor-free for a period of at least 3 months.
 2. Bland, odor-free denatured milk or cheese whey according to claim 1.
 3. Bland, odor-free denatured soybean protein according to claim 1.
 4. Bland, odor-free denatured natural protein according to any one of claims 1 to 3, which in the dry state remains substantially bland and substantially odor-free for a period of at least 6 months.
 - 45 5. Bland, odor-free denatured natural protein according to any one of claims 1 to 4, which in the dry state remains substantially bland and substantially odor-free for a period of at least 12 months.
 - 50 6. A process for preparing bland, odor-free denatured natural proteins which comprises contacting the protein with lipase at a temperature of from about 80°F to about 140°F (about 26.7°C to about 60.0°C) and removing the lipase-produced hydrolysis products to obtain bland, odor-free denatured natural protein wherein the protein is milk or cheese whey, lactalbumen, beta lactoglobulin, serum albumen, immunoglobulins, or soybean protein which in the dry state remains substantially bland and substantially odor-free for a period of at least 3 months.
 - 55 7. A process according to claim 6, wherein from about 0.05 to about 0.15 percent of lipase is employed based on the protein weight.
 8. A process according to claim 7 or claim 8, wherein the temperature is from about 120°F to about 140°F (about 48.9°C to about 60.0°C).

9. A process according to any one of claims 6 to 8, wherein said contacting is for a period of from about 1 to about 3 hours.
- 5 10. A process according to any one of claims 6 to 9, wherein the protein is whey protein.
11. A process according to any one of claims 6 to 9, wherein the protein is soybean protein.
- 10 12. A foodstuff comprising at least one of bland, odor-free denatured whey protein, lactalbumen and soybean protein which in the dry state remains substantially bland and substantially odor-free for a period of at least 3 months.

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⑤⑦ An enzymatic protein process removes objectionable odor and offensive taste from natural proteins to produce bland, odor-free products.

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EUROPEAN SEARCH REPORT

Application Number
EP 93 30 3675

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cls)
X	DATABASE WPI Week 7043, Derwent Publications Ltd., London, GB; AN 70-79879 & JP-A-45 033 741 (MORINAGA MILK IND CO LTD) 1968 * abstract *	1, 10	A23J3/08 A23J3/16 A23L1/015 A23J3/34 A23L1/211 A23C9/12
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X	DATABASE WPI Week 9232, Derwent Publications Ltd., London, GB; AN 92-266493 & SU-A-1 687 227 (FOOD CONCENTRATES RES. INST.) 30 October 1991 * abstract *	1, 4, 5	
X	US-A-5 055 310 (AJINOMOTO CO. INC.) * column 1 - column 3; claim 6 *	1, 3, 4	
A	DE-A-23 11 682 (MAIZENA GMBH) * page 3; claims 1, 4 * * page 6, paragraph 3 *	1, 3, 6, 12	TECHNICAL FIELDS SEARCHED (Int.Cls)
A	EP-A-0 269 593 (ALBUGLOBE A.B.) * the whole document *	1, 2, 4, 5, 10, 12	A23J A23L A23C
A	DATABASE WPI Week 7843, Derwent Publications Ltd., London, GB; AN 78-77255 & JP-A-53 107 440 (MISUZU DOFU KK) 19 September 1978 * abstract *	1, 3, 6, 11, 12	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 September 1994	Examiner Kanbier, D
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document</p>			

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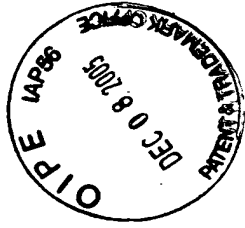
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Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 414 024 (SOCIETE DES PRODUITS NESTLE S.A.) * page 3; claims 8-11 * * page 2, paragraph 7 *	1,3,6-9, 11,12	
P,X	EP-A-0 531 104 (OTSUKA FOODS CO LTD) * page 2 - page 3; claims 1,2,4-7,11,13,20 * * page 5, paragraph 9 *	6,10-12	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
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